



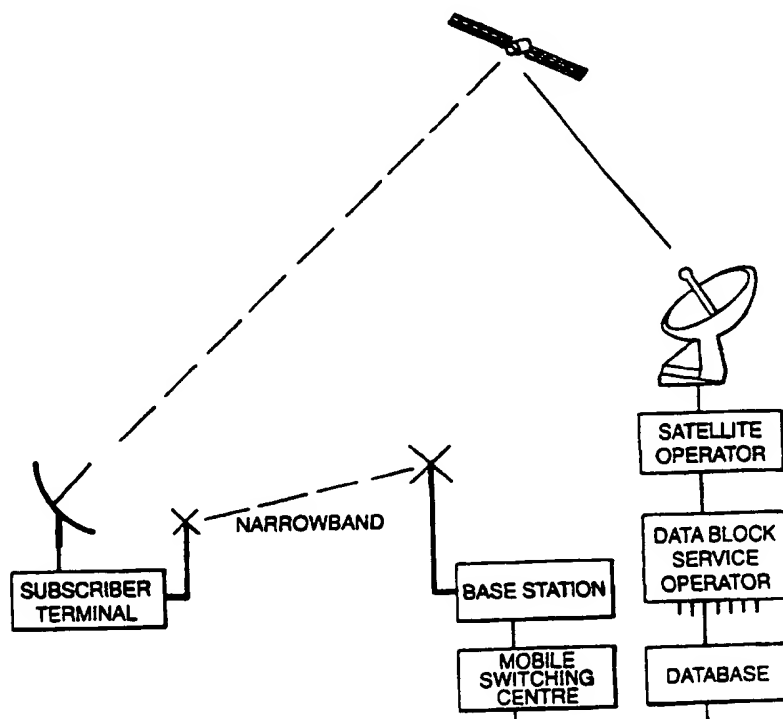
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : H04N 7/173		A1	(11) International Publication Number: WO 97/07634
			(43) International Publication Date: 27 February 1997 (27.02.97)
(21) International Application Number: PCT/GB96/01992		(81) Designated States: AL, AM, AT, AU, AZ, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, US, UZ, VN, ARIPO patent (KE, LS, MW, SD, SZ, UG), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).	
(22) International Filing Date: 15 August 1996 (15.08.96)			
(30) Priority Data: 9516813.4 16 August 1995 (16.08.95) GB			
(71) Applicant (for all designated States except US): GPT LIMITED [GB/GB]; New Century Park, P.O. Box 53, Coventry CV3 1HJ (GB).			
(72) Inventor; and (75) Inventor/Applicant (for US only): CHOPPING, Geoffrey [GB/GB]; Tregarth, Furze Hill, Wimbourne, Dorset BH21 4HD (GB).			
(74) Agent: BRANFIELD, Henry, Anthony; GEC Patent Dept., Waterhouse Lane, Chelmsford, Essex CM1 2QX (GB).			
		Published With international search report.	

(54) Title: DATA DELIVERY SERVICES

(57) Abstract

A telecommunications data transmission system can provide transmission of data blocks using a unidirectional broadband link and a duplex narrowband link between two subscribers, the narrowband link providing control and addressing information regarding the data blocks sent via the broadband link from the first to the second subscriber, the transmission on the broadband link possibly being sent using Motion Picture Expert Group 2 encoding.



FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AM	Armenia	GB	United Kingdom	MW	Malawi
AT	Austria	GE	Georgia	MX	Mexico
AU	Australia	GN	Guinea	NE	Niger
BB	Barbados	GR	Greece	NL	Netherlands
BE	Belgium	HU	Hungary	NO	Norway
BF	Burkina Faso	IE	Ireland	NZ	New Zealand
BG	Bulgaria	IT	Italy	PL	Poland
BJ	Benin	JP	Japan	PT	Portugal
BR	Brazil	KE	Kenya	RO	Romania
BY	Belarus	KG	Kyrgyzstan	RU	Russian Federation
CA	Canada	KP	Democratic People's Republic of Korea	SD	Sudan
CF	Central African Republic	KR	Republic of Korea	SE	Sweden
CG	Congo	KZ	Kazakhstan	SG	Singapore
CH	Switzerland	LI	Liechtenstein	SI	Slovenia
CI	Côte d'Ivoire	LK	Sri Lanka	SK	Slovakia
CM	Cameroon	LR	Liberia	SN	Senegal
CN	China	LT	Lithuania	SZ	Swaziland
CS	Czechoslovakia	LU	Luxembourg	TD	Chad
CZ	Czech Republic	LV	Larvia	TG	Togo
DE	Germany	MC	Monaco	TJ	Tajikistan
DK	Denmark	MD	Republic of Moldova	TT	Trinidad and Tobago
EE	Estonia	MG	Madagascar	UA	Ukraine
ES	Spain	ML	Mali	UG	Uganda
FI	Finland	MN	Mongolia	US	United States of America
FR	France	MR	Mauritania	UZ	Uzbekistan
GA	Gabon			VN	Viet Nam

DATA DELIVERY SERVICES

Motion Picture Expert Group - 2 (MPEG-2) is one system for encoding video in a digital
5 form, though it is to be expected that other encoding systems will occur in the future.

MPEG-2 can be transported via terrestrial radio, satellite and cable using the appropriate
transmission modulation schemes and associated forward error correction methods. This
provides a good quality video delivery arrangement and has a large bandwidth.
10

An MPEG-2 signal also includes the multi-channel audio encoding and the carrying of
additional data.

Many MPEG-2 signals of encoded video, each with additional audio and data
15 information, can be carried by one MPEG-2 TRANSPORT STREAM.

If required an MPEG-2 signal can carry only audio, or only data, which means that an
MPEG-2 TRANSPORT STREAM has use as a general purpose method of carrying multiple data
signals.
20

Consequently as the use of MPEG-2 increases, for delivering video, so does the
opportunity to use the MPEG-2 TRANSPORT STREAM as a means of delivering other data
services.

A complete MPEG-2 signal carrying only data as a high bit rate Teletext type of service may be used for providing general information. However such a fixed type of service is only suitable for carrying general public information even if a charge is made for receiving the information.

5

While MPEG-2 forms a convenient encoding and transport system for the transmission of data, other systems may be used.

According to the present invention there is provided a telecommunications data
10 transmission arranged for transmission of data blocks and comprising a unidirectional broadband link and a duplex narrowband start-up link between a first and a second subscriber the narrowband link providing control and addressing information regarding data blocks sent via the broadband link from the first to the second subscriber.

15 The broadband link may be a satellite link.

The present invention will now be described, by way of example, with reference to the accompanying drawings, in which:-

20 Figure 1 is a diagrammatic illustration of a unidirectional data delivery system; and
Figure 2 is a diagrammatic illustration of a bidirectional data delivery system.

Using conventional dial-up narrowband circuits it is possible for a remote subscriber to be connected to a database. The call can be initiated by the subscriber or the database.

The quantity of information that subsequently needs to be transferred from the database to the subscriber may be expensive for the capability of the dial-up narrowband circuit.

5 If the subscriber is connected to an MPEG-2 Delivery Service, for example via a satellite as shown in Figure 1, then if the Database can forward an encrypted block of MPEG-2 data, to the Data Block Service Operator, for forwarding to the Satellite Operator, then the encrypted block of MPEG-2 data can be sent up to the satellite for broadcasting.

10 In order to ensure that only the correct Subscriber Terminal can decode the information, the encryption key is sent to the subscriber from the database via the narrowband circuit. The Subscriber Terminal is also supplied with further addressing necessary to identify the encrypted block of data intended for the Subscriber Terminal. The header, the further address and the sequence number should not be encrypted.

15 The unidirectional service described above can be used for a large number of applications. One application is for a head office sending information to one of its remote sites, particularly if they have temporary locations such as building sites.

20 Provided some Subscriber Terminals have the necessary packet identity codes, further addressing and encryption keys then a head office can broadcast to many local offices at the same time.

Although the use of Motorised Satellite Receivers enables the Subscribers Terminal to be portable, the use of Terrestrial Radio with Orthogonal Frequency Division Modulation

(OFDM) modulation would enable the Subscriber Terminal to be mobile.

The broadcast satellite used for this service only requires to be able to receive from one ground station. It does not need to be a communications satellite which can receive from many moving ground stations.

The unidirectional arrangement above relies on the Database having a wideband connection to the Data Block Service Operator.

Two databases which were both connected onto the same Data Block Service Operator would be able to perform block transfers without using the satellite.

It is possible for two Databases which are connected to Different Block Service Operators on different satellites, perhaps several thousand miles apart, to perform bi-directional data transfers. Provided that each Database also had a motorised satellite receiver and subscribers terminal, so that it can receive from the appropriate satellite, then two unidirectional paths can be configured.

In Figure 2, one path is from Database A, via Data Block Service Operator A and Satellite A, to the motorised satellite receiver and Subscribers Terminal of Database B.

The other path is from Database B, via Data Block Service Operator B and Satellite B, to the motorised satellite receiver and Subscribers Terminal of Database A.

In order to establish the bi-directional path only one narrowband path should be needed.

Provided the Data Block Service Operator is prepared to leave addresses in place then the narrowband path could be cleared once the two unidirectional paths were established, however this would mean there was no positive acknowledgement of an encrypted block of MPEG-2 data, unless the acknowledgement is performed by the sending of a complete encrypted block of MPEG-2 data in the opposite direction. A standard small acknowledgement block can be used for this.

Another use for the motorised satellite receiver and subscribers terminal that is equipped with a Database, is to directly monitor that the encrypted blocks of MPEG-2 data are being correctly forwarded by the satellite.

The size of the encrypted blocks of MPEG-2 data should be about one Mbit, in order to achieve a reasonable throughput with only one block outstanding though perhaps several sizes can be accepted:-

Very Small Acknowledgement Block (Bi-directional Service only)

Small encrypted data block of MPEG-2 (perhaps 0.5 Mbit/s)

Medium encrypted data block of MPEG-2 (perhaps 1.0 Mbit/s)

Large encrypted data block of MPEG-2 (perhaps 2.0 Mbit/s)

The download rate may be constrained by the data rate of the link between the Database and the Data Block Service Operator.

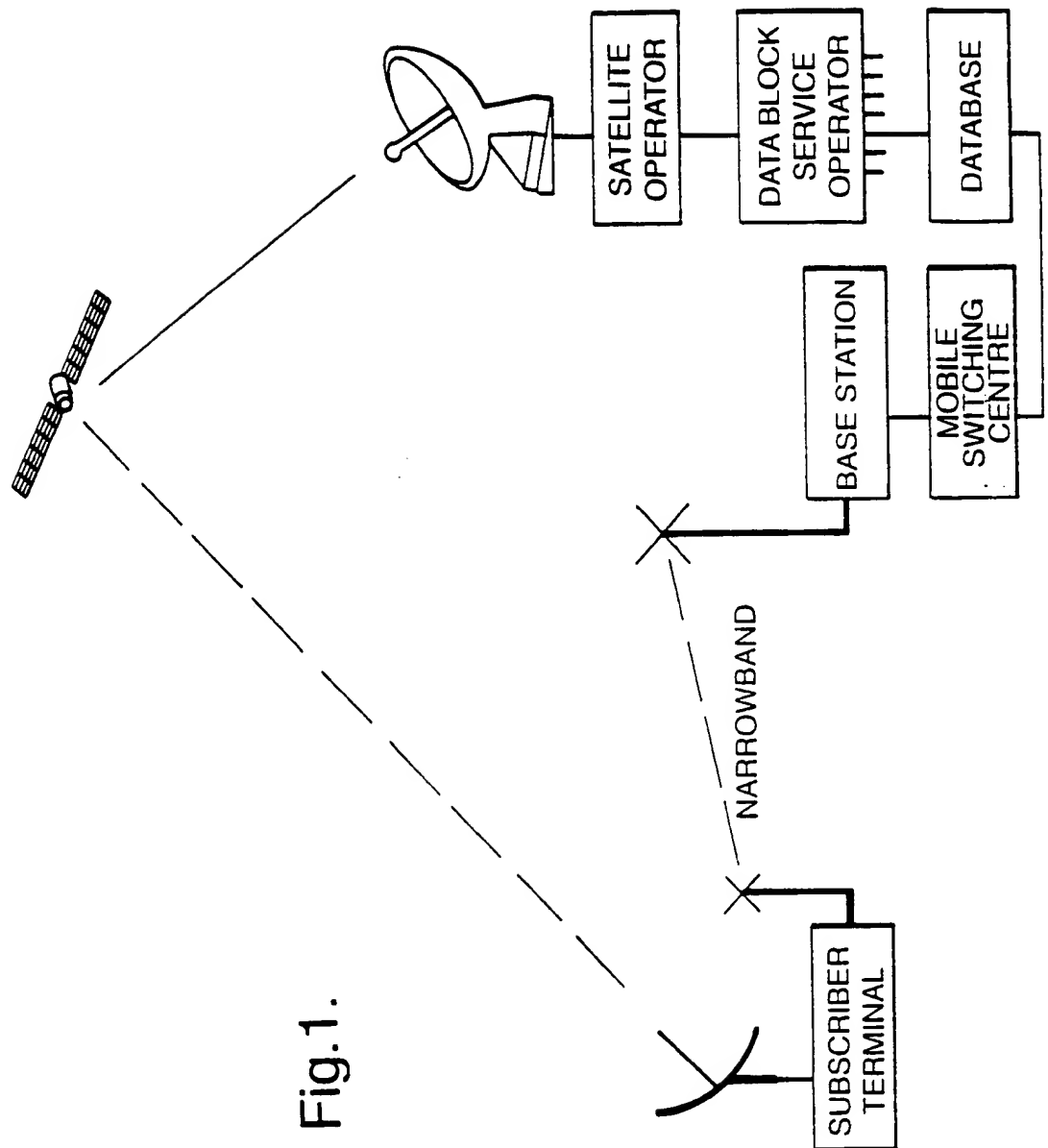
Charging will probably be done on a per block basis, with different rates for different block sizes.

CLAIMS

1. A telecommunications data transmission system arranged for transmission of data blocks and comprising a unidirectional broadband link and a duplex narrowband start-up link between
5 a first and a second subscriber, the narrowband link providing control and addressing information regarding data blocks sent via the broadband link from the first to the second subscriber.
2. A system as claimed in Claim 1, wherein the data blocks are encrypted and the
10 encryption key is transmitted via the narrowband link, the control and addressing information not being encrypted.
3. A system as claimed in Claim 1 or 2, wherein the data blocks are formed from data obtained from a database controlled by the first subscriber.
- 15 4. A system as claimed in any preceding claim, comprising a further unidirectional broadband link whereby data blocks may be sent from the second to the first subscriber, the narrowband link providing control and addressing information for both directions of data block transmission.
- 20 5. A system as claimed in any preceding Claim, wherein the broadband link or links employ an Motion Picture Expert Group - 2 (MPEG-2) signal.
6. A system as claimed in any preceding claim, wherein the and/or the further broadband

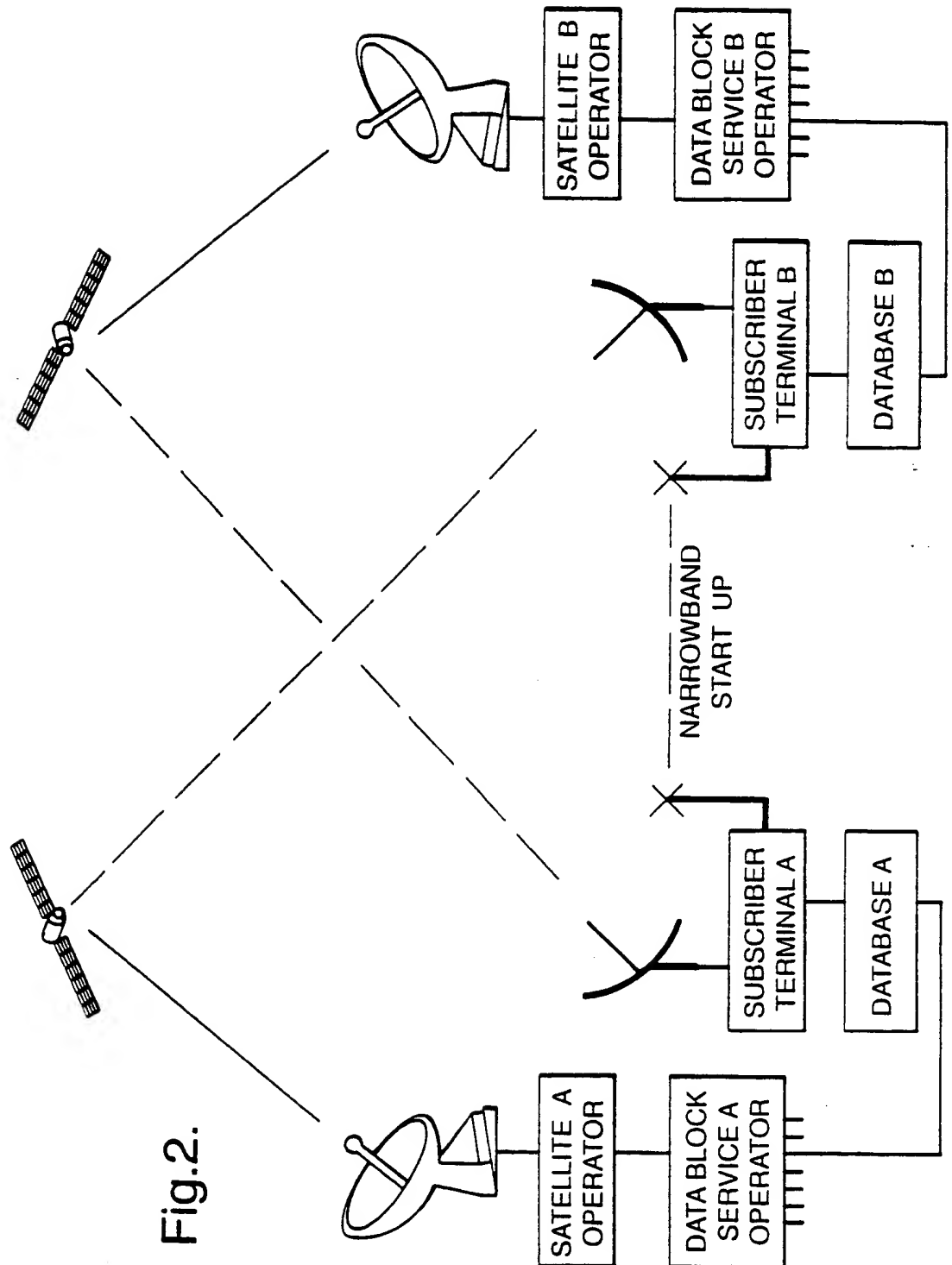
link is a satellite link.

7. A system as claimed in any preceding Claim wherein the data blocks are formed from data obtained from a database controlled by the first subscriber.



SUBSTITUTE SHEET (RULE 26)

2/2



SUBSTITUTE SHEET (RULE 26)

INTERNATIONAL SEARCH REPORT

Inte nal Application No
PCT/GB 96/01992

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 H04N7/173

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 H04N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	<p>WO,A,94 10803 (TV ANSWER INT INC ;DINKINS GILBERT M (US)) 11 May 1994</p> <p>see page 1, line 13 - line 22 see page 10, line 3 - page 11, line 14 see page 14, line 15 - page 17, line 10 see page 19, line 9 - page 20, line 17 see figures 1-9</p> <p style="text-align: center;">--- -/-</p>	<p>1,3,6,7 4,5</p>

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *&* document member of the same patent family

Date of the actual completion of the international search

13 November 1996

Date of mailing of the international search report

4.12.96.

Name and mailing address of the ISA
European Patent Office, P.B. 5818 Patentaan 2
NL - 2280 HV Rijswijk
Tel. (+ 31-70) 340-2040, Tx. 31 651 epo nl,
Fax (+ 31-70) 340-3016

Authorized officer

Van der Zaal, R

INTERNATIONAL SEARCH REPORT

International Application No
PCT/GB 96/01992

C.(Continuation)- DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO,A,94 14273 (VOXSON INTERNATIONAL PTY LIMIT ; LONGGINOU LUCAS (AU); MAEDER ANTHO) 23 June 1994	4,5
A	see page 1, line 19 - page 3, line 14 see page 9, line 27 - page 10, line 6 see page 15, line 18 - line 27 see page 17, line 5 - page 18, line 3 see page 22, line 6 - line 20 see figures 1-3 ---	1-3,6,7
A	WO,A,94 24783 (CONIFER CORP) 27 October 1994 see page 2, line 10 - page 3, line 12 see page 3, line 30 - page 4, line 17 see page 10, line 19 - page 11, line 33 see page 12, line 15 - page 14, line 10 see page 17, line 11 - line 33 see figures 1-3 -----	1,6

1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 96/01992

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO-A-9410803	11-05-94	US-A- 5388101	07-02-95
		AU-A- 5895894	24-05-94
		CA-A- 2147837	11-05-94
		CN-A- 1090444	03-08-94
		CZ-A- 9501069	13-03-96
		EP-A- 0666010	09-08-95
		FI-A- 951960	25-04-95
		HU-A- 71648	29-01-96
		JP-T- 8503582	16-04-96
		US-A- 5481546	02-01-96
		ZA-A- 9307728	13-05-94
WO-A-9414273	23-06-94	AU-A- 5804994	04-07-94
		CA-A- 2151581	23-06-94
		CN-A- 1092578	21-09-94
		EP-A- 0679312	02-11-95
		JP-T- 8505015	28-05-96
		ZA-A- 9309454	07-09-94
WO-A-9424783	27-10-94	US-A- 5437052	25-07-95
		AU-A- 6631594	08-11-94
		US-A- 5394559	28-02-95

Form PCT/ISA/210 (patent family annex) (July 1992)

